



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/566,070

01/26/2006

Pierre-Ernest Bernstein

1606.74544

9426

24978 7590 02/09/2011

GREER, BURNS & CRAIN
300 S WACKER DR
25TH FLOOR
CHICAGO, IL 60606

EXAMINER

LI, JUN

ART UNIT

PAPER NUMBER

1732

MAIL DATE

DELIVERY MODE

02/09/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/566,070	Applicant(s) BERNSTEIN ET AL.	
	Examiner JUN LI	Art Unit 1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,6,7,11-13 and 21-32 is/are pending in the application.
- 4a) Of the above claim(s) 11-13 and 21-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 6-7 and 32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. **Claim 1 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa et al (US6066598) in view of Arendt (US2003/0144150), Enokihara (US6239674) and Ahn (US 5834405).**

Ishikawa teaches a method for forming a superconducting component with a stack of alternative superconductor layers and dielectric layers (i.e. insulating layer) (Figure 1) wherein superconductors (item 1, 2, 3, 4, 5 Figure 1) and thin-film dielectrics (item 30-1, 30-2, 30-3, 30-4, 30-5) are alternately laminated with each other thus a superconducting multilayer electrode is formed on the top surface of a dielectric substrate (Figure 1 item 10, column 3 lines 56-60) and a main transmission line (item LN10 Figure 10) and sub-transmission lines (LN1-LN4 figure 1) are formed (column 4 lines 35-46) there. Ishikawa also teaches a conductor (item 12 Figure 1) for an input terminal is formed on the direct substrate (item 10, Figure 1) and another conductor (item 13 Figure 1) for an output terminal is formed on dielectric substrate (column 5 lines 1-6) wherein capacitive coupling between one end of superconductor 5 to the input/output terminal are used (column 5 lines 11-16).

Art Unit: 1732

Regarding claim 1, Ishikawa fails to expressly teach depositing an insulating film directly on a substrate, and incorporating at least one terminal in the submission lines, i.e. direct connection of terminal to the place of the capacitive coupling as described above.

Arendt teaches one or more suitable buffer layer can be deposited onto a substrate to provide the necessary structural template for epitaxial growth of the superconducting layer wherein such buffer layer (film) can be an inert material such as YSZ (yttrium stabilized zirconia), SrTiO_3 etc ([0004], [0011], [0038], [0040]).

It would have been obvious to one of ordinary skill in the art to adopt the buffer layer (i.e. an inert ceramic or an insulating material) as shown by Arendt to modify the superconducting component of Ishikawa because such deposited buffer layer can help provide enhanced chemical or structural compatibility for growth of superconducting material layers as suggested by Arendt ([0004], [0036]-[0038]).

Ahn teaches a method for extending the pattern of the metallic conductor lines and superconducting oxide reaction layer to a surface of the substrate to establish an electrical contact between (e.g. terminal means) at an appropriate portions of a superconducting ceramic substrate or superconducting multilayer (claim 20, col. 6 lines 25-30).

Enokihara teaches input/output terminals comprise transmission lines wherein one end of transmission line is coupled with the conductor comprising the resonator by capacitance or inductance (col. 3 lines 49-53). Enokihara further teaches such conductor can be a superconductor (col. 3 lines 59-61).

It would have been obvious to one of ordinary skill in the art to adopt the direct contact (terminal means) as shown by Ahn to improve the superconducting component of Ishikawa for expanding different connections means between superconducting lines and for establishing terminals at an appropriate portion of a superconducting multilayer. Furthermore, it is to be noted that this direct incorporation terminal with the line segment is merely one of several obvious options that a person skill in the art seeking to solve the stated connection problem needed for particular connection for intended use of the superconductor component under certain circumstance.

It is noted that capacitive coupling (gap) and direct connection (i.e. inductive coupling) are two connections commonly used in the art wherein one is the capacitive coupling (gap) while the other one is direct connection (inductive coupling) such as demonstrated by Enokihara who teaches that these two connections are functional equivalent for coupling terminals with resonators via either capacitance or inductance.

It would have been obvious for one of ordinary skill in the art at the time of invention filed to substitute one of such functional equivalent connection means with another one for similar results.

It is noted that a prior step of depositing a superconducting film on a substrate followed by the depositing of stack is expected since superconducting and dielectric layers are alternatively laminated.

Regarding claim 32, it is noted that such limitation is directed to an intended use of the superconducting component where it merely recites the intended use of the superconducting component while the body of the claim recited process steps are able

Art Unit: 1732

to stand alone, that is the recited intended uses cannot help make the claimed method in the instant application patentable distinct from the prior arts. Thus it cannot be given patentable weight.

2. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa et al (US6066598) in view of Arendt (US2003/0144150), Enokihara (US6239674) and Ahn (US 5834405) as applied above, and further in view of Lee et al (IEEE TRANSACTIONS ON MAGNETICS, 1991, 27: 1365-1368).

The references of Ishikawa in view of Arendt, Ahn and Enokihara have been described as above. The references do not expressly state that the material for superconducting and dielectric film is crystallized.

Lee et al teach that the LaAlO_3 and YBCO (i.e. $\text{YBa}_2\text{Cu}_3\text{O}_7$) (page 1365 left column "introduction" second paragraph line 2) can be used respectively for insulating and superconducting materials in superconducting multilayers (abstract lines 1-2), where LaAlO_3 and YBCO films can be crystallized (page 1366 left column "Results" first paragraph lines 1-4) with sharp and clean interface between the deposited insulating crystal LaAlO_3 and its substrate as indicated by Lee et al (page 1365 abstract lines 6-7).

It would have been obvious to one ordinary skill in the art the time of invention filed to crystallize the insulating and superconducting film of Lee to improve the superconductors of Ishikawa in view of Arendt, Ahn and Enokihara. One of ordinary skill in the art would have been motivated to do so because the crystallization of the films can provide sharp and clean interface (i.e. Perfectly crystallized) between the insulating and superconducting film as indicated by Lee et al (page 1365 abstract lines

Art Unit: 1732

6-7). Furthermore, adopting a known technique for improving similar method is well within the scope of one ordinary skill in the art.

3. Claim 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa et al (US6066598) in view of Arendt (US2003/0144150), Enokihara (US6239674) and Ahn (US 5834405) as applied above, and further in view of Higaki (US5219827).

The references of Ishikawa in view of Arendt, Ahn and Enokihara fail to expressly teach etching the stack and the superconducting film.

Higaki teaches an etching method for producing an inductive component comprising means for depositing a stack of superconducting films by vacuum evaporation and insulating films and means for etching the superconducting film by hydrochloric acid (col. 4 lines 10-11, 59-63, Figure 1 B, col. 6 lines 29-39, 58-65), which read onto the recited well known depositing and etching method in the instant specification (page 7 lines 6-12).

It would have been obvious to one ordinary skill in the art the time of invention filed to adopt the etching technique as taught in Higaki to modify the multilayer superconductors of Ishikawa in view of Arendt, Ahn and Enokihara. One of ordinary skill in the art would have been motivated to do so because this known technique can successfully stack and etching different components of multilayer superconductors for a desired pattern as shown by Higaki. Furthermore, adopting known technique from a similar method is well within the scope of one ordinary skill in the art.

Response to Arguments

Applicant's arguments filed 01/04/2011 have been fully considered but they are not persuasive. In response to applicant's arguments about Arendt teaching away, Arendt discloses previously method produced insulating layer deposited on the substrate has such disadvantage for commercial production ([0004]), then Arendt provided his method of producing an improved composite substrate with a layer of insulating layer (YSZ layer) ([0011], [0038], [0040]). As to applicants arguments about such disadvantage, Arendt does disclose the performance of such conductors are satisfactory which is a benefit for one of ordinary skill in the art to adopt such insulating film deposited substrate. Furthermore, there is no factual evidence and data from applicant to show the instant application will provide a commercial advantage either.

In response to applicant's arguments about the references not disclosing a superconducting component having a stack of layers that exhibit a high inductance, it is noted that such limitation are not claimed. Furthermore, applied references already teach a substantially similar superconducting component, thus substantially similar property, i.e. a high inductance is thus expected. As for the arguments about the claimed superconducting component being operated at a high conductance, it is noted that such a limitation merely recites the intended use of the superconducting component while the body of the claim recited process steps are able to stand alone, that is the recited intended uses cannot help make the claimed method in the instant application patentably distinct from the prior arts. Thus it cannot be given patentable weight. The

Art Unit: 1732

Court held that the intended use of hair curling was of no significance to the structure and process of making (*In re Sinex*, 309 F.2d 488, 492, 135 USPQ 302, 305 (CCPA 1962)).

In response to applicant's arguments about Ishikawa not disclosing a superconducting film being deposited on an insulating film, it is noted that Arendt already discloses that an insulating layer can be deposited on the substrate for providing enhanced chemical or structural compatibility for growth of superconducting material layers as suggested by Arendt ([0004], [0036]-[0038]). Thus depositing a superconducting layer on such insulating layer deposited substrate is well within the scope of one ordinary skill in the art. It is noted that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

Art Unit: 1732

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUN LI whose telephone number is (571)270-5858. The examiner can normally be reached on Monday-Friday, 9:00am-5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

Art Unit: 1732

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JUN LI/
Examiner, Art Unit 1732
01/31/2011

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1732